

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

**Claim 1 (Canceled)**

**Claim 2 (Currently Amended):** A micro-bubble generating system, comprising a container main unit having an interior space of frusto-conical shape and being closed at one end, a pressurized liquid inlet opening communicating tangentially with said interior space, a gas introducing hole opening at one end of said frusto-conical space to generate a swirling gas that is ~~directly impinged upon~~ forcibly cut off and smashed by direct impingement by swirling pressurized liquid introduced through said liquid inlet, and a swirling gas-liquid mixture outlet opening at the other end of said interior space and operative to discharge micro-bubbles therefrom.

**Claim 3 (Previously Presented):** A micro-bubble generating system according to one of claims 2 or 10, wherein a plurality of pressurized liquid inlet openings are tangentially disposed on a part of a circumferential surface of the container and communicate at spaced locations about the circumference of the container wall with the interior space.

**Claim 4 (Previously Presented):** A micro-bubble generating system according to one of claims 2 or 10, wherein said pressurized liquid inlet opening opens on a part of the circumferential surface of the container near said gas-mixture outlet from said interior space.

**Claim 5 (Canceled)**

**Claim 6 (Withdrawn):** A micro-bubble generating system according to one of claims 1 or 2, wherein a baffle plate is arranged closely spaced from the swirling gas-liquid mixture outlet from the interior space.

**Claim 7 (Withdrawn):** A micro-bubble generating system according to one of claims 1 or 2, wherein a partition plate for closing the outlet is attached, leaving only a partial opening defining the swirling gas-liquid mixture outlet from the interior space.

**Claim 8 (Currently Amended):** A method for micro-bubble generation, using a micro-bubble generating system, which comprises a container main unit having an interior space with a bottom, a pressurized liquid inlet opened in a tangential direction on a part of a circumferential surface of an inner wall of the space, a gas introducing hole opened at the bottom of the interior

space, and a swirling gas-liquid mixture outlet opened at a mixture discharge end of the interior space, whereby said method comprising the steps of:

forming a swirling gas cavity along which self-sucked gas is swirled and guided while flowing in a narrow stream of swirling gas flow in the interior space; and

generating micro-bubbles by forcibly cutting off and ~~directly impinging~~ smashing the swirling gas cavity with swirling pressurized liquid to generate a difference of swirling velocity between the gas and liquid portions in the swirling gas cavity.

**Claim 9 (Currently Amended):** A method for micro-bubble generation, using a micro-bubble generating system, which comprises a container main unit having an interior space with a bottom, a pressurized liquid inlet opened in a tangential direction on a part of a circumferential surface of an inner wall of the space, a gas introducing hole opened at the bottom of the interior space, and a swirling gas-liquid mixture outlet opened at a mixture discharge end of the interior space, whereby said method comprising the steps of:

forming a swirling gas cavity for swirling and guiding self-sucked gas along a narrow gas flow stream in the interior space;

generating micro-bubbles by forcibly cutting off and directly impinging the swirling gas cavity with swirling pressurized liquid to generate a difference of swirling velocity between the portions in the swirling gas cavity; and

continuously cutting off and ~~directly impinging~~ smashing the swirling gas cavity in said interior space to generate a relative increase of the difference in rotating velocity between a rotating cut-off portion and impinged portion in the second step, the liquid passing through the rotating cut-off portion of gas cavity being rapidly diffused while the diffused rotating gas fluid mixture is stably formed and an angle of diffusion of the rotating mixture is large, and wherein a difference of rotating velocity between gas and liquid streams is relatively increased between the rotating cut-off portion and the smashing impinged portion of the swirling gas cavity portion.

**Claim 10 (Currently Amended):** A micro-bubble generating system, comprising:  
a container ~~defining a cylindrical~~ having an interior space defined by a surface of revolution,  
a container bottom closing said space at one axial end thereof and a gas-liquid mixture outlet opening at the other end thereof,  
a liquid inlet opening communicating tangentially with said interior space adjacent said gas-liquid mixture outlet opening,  
means for injecting pressurized liquid through said liquid inlet opening as a centrifugally flowing fluid into said interior space,  
a gas introducing hole disposed in the container bottom and operative to introduce gas into said interior space, said stream of gas being induced to swirl as a narrow low pressure flow stream in said interior space by said centrifugally flowing liquid,

wherein said swirling pressurized liquid introduced through said pressurized liquid inlet directly impinges on said narrow swirling gas flow stream adjacent said gas-liquid mixture outlet to tear down said swirling gas flow stream and thereby generate micro-bubbles for discharge from said gas-liquid mixture outlet opening.